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POOL CLEANER CONTROL DEVICE

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I. TITLE: *POOL CLEANER CONTROL DEVICE*

II. BACKGROUND OF THE INVENTION

1. Field of the Invention.

The present invention relates to a pool cleaner control device, and more particularly, to a control device for pool skimmers used to filter the water in a body of water, such as a swimming pool.

2. Description of the Related Art.

Several designs for pool cleaner devices have been designed in the past. These devices are generally referred to as skimmers and they typically include a filter basket assembly that collects debris from the body of water they clean. The inlet is typically connected to a hose that sucks the water from an area of a body of water. This inherently limits the cleaning operation to one inlet port only. The present invention includes a device used with skimmers that permits a user to switch from two active ports or inlets after a predetermined period of time. This permits a user to process (filter) water from two different areas.

III. SUMMARY OF THE INVENTION

It is one of the main objects of the present invention to provide a control device for switching the operation of a skimmer between two inlet ports connected to a body of water thereby permitting a user to clean the water from two separate areas.

It is another object of this invention to provide a device that works with skimmers to filter the water in a pool.

It is yet another object of this invention to provide such a device that is inexpensive to manufacture and maintain while retaining its effectiveness.

Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

With the above and other related objects in view, the invention consists in the details of construction and combination of parts as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Figure 1 represents a partial cross-sectional view of the preferred embodiment for the present invention where the inlet connected to the hose is operational.

Figure 2 shows the partial cross-sectional view of figure 1 in the opposite position with the inlet connected to the hose is blocked and the other inlet operational.

Figure 3 illustrates an enlarged cross-sectional view of the piston's shaft, showing the restricting valve assembly and the filter cap assembly used for the present invention.

Figure 4 is a representation of a partial cross-sectional view of an alternate embodiment for the present invention, wherein the diaphragm has an inverted cup shape.

Figure 5 shows of a partial cross-sectional view of other alternate embodiment for the present invention, wherein a spring member is used.

V. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, where the present invention is generally referred to with numeral **10**, it can be observed that it basically includes skimmer assembly **20**, cover assembly **30**, housing assembly **40**, electrical suction pump **50**, piston assembly **60** and flexible diaphragm skirt **70**, as shown in figure 1. Timer assembly **150** is used to set predetermined operation time intervals.

As seen in figure 1, skimmer assembly **20** includes cylindrical housing **22** with bottom wall **24** and filter basket assembly **26** housed therein. Filter basket assembly **26** includes outwardly extending peripheral flange **27**, which is mounted to inwardly extending supporting flange **21** of housing **22**. Bottom wall **24** includes bottom outlet port **25**.

Cover assembly **30** includes inlet through openings **32** and **34** and shaft through opening **36**. Hose **31** has one end mounted to inlet through

opening **32** and its distal end suctions the water from the bottom of the swimming pool at a remote location. Cover assembly **30** also includes hingedly mounted valve assembly **38** for selectively closing inlet through opening **34**. Actuating member **33** has ends **35** and **35'**. End **35** is attached to upper end **65** of elongated tubular shaft **64** and end **35'** is cooperatively engaged to the distal end of valve assembly **38** to open and close the latter in response to the position of upper end **65**. Cover **30** and inwardly extending supporting flange **21** sandwich flange **27**. Thus, there are only three openings through which water enters housing assembly **40**.

Housing assembly **40** is mounted within filter basket assembly **26** of skimmer assembly **20** and held in place with fasteners **39** that pass through cover **30**. Housing assembly **40** includes internal wall **42**. In the preferred embodiment, housing assembly **40** includes lower and upper cylindrical members **44** and **48**, respectively, coaxially mounted. Cylindrical members **44** and **48** are longitudinally and abbutingly mounted with respect to each other. Lower cylindrical member **44** includes ends **45** and **47**. End **45** is closed with bottom wall **46** and end **47** is open. Upper cylindrical member **48** is open at both ends and includes cutout **41**.

Electrical suction pump **50** includes inlet **52** and outlet **54**. Inlet **52** is connected to outlet port **25** of bottom wall **24**. The suctioned and filtered water returns to the body of water through outlet **54**.

Piston assembly **60** is housed within lower cylindrical member **44** in figure 1. Piston assembly **60** includes bottom surface **62** and top surface **63**. Shaft **64** is perpendicularly with respect to surface **63** and passes through piston assembly **60**. Elongated tubular shaft **64** passes through central

opening **36**. Sealing sleeve **37** is secured to opening **36** to permit shaft **64** to go through. Elongated tubular shaft **64** has cooperative dimensions to slidably and sealingly passes through sleeve **37**. As best seen in figure 3, shaft **64** includes upper end **65** with internal threaded portion **66** and lower end **67** has external threaded portion **68**. Central through opening **69** includes conical recess **169** ending with a larger internal at end **65**.

Lower plate **76** and upper plate **74** include cooperative central threaded openings **75** and **77** that receive threaded portion **68**. One of their functions is to secure shaft **64**. Upper plate **74** is mounted against bottom surface **62** and with lower plate **76** sandwiching skirt **70**. Lower plate **76** comes in contact with bottom wall **46** at the lowermost position of piston assembly **60**.

In the preferred embodiment shown in figures 1 and 2, flexible diaphragm skirt **70** has a substantially hemispherical shape covering piston assembly **60**. Flexible diaphragm skirt **70** includes central opening **71** and peripheral edge **72**. Flexible diaphragm skirt **70** covers bottom surface **62** of piston assembly **60** and extends around the peripheral outer wall of piston assembly **60**. Peripheral edge **72** is mounted over open end **47** of lower cylindrical member **44**, in the preferred embodiment. Peripheral edge **72** is sandwiched between cylindrical members **44** and **48**. Peripheral edge **72** can also be fixed to internal wall **42** of housing assembly **40** in other manners. Flexible diaphragm skirt **70** is secured to bottom surface **62** with upper and lower plates **74** and **76**. Upper plate **74** has threaded central opening **75**. Lower plate **76** has threaded central opening **77**. Upper plate **74** is rigidly mounted to bottom surface **62** of piston assembly **60**. External threaded portion **68** of lower end **67** passes through central

opening **61**, engage threaded central opening **75**, central opening **71** and engage to threaded central opening **77**, as best seen in figures 1 and 2.

As best seen in figure 3, restricting valve assembly **80** is removably mounted to central through opening **69** of elongated tubular shaft **64** next to end **65**. Restricting valve assembly **80** rests inside recess **169**. Restricting valve assembly **80** includes central through opening **81**, upper and lower ends **82** and **84**, longitudinal channels **86**, and O-ring **88**. Through opening **81** has a considerably smaller diameter than central through opening **69** of elongated tubular shaft **64**. With the reduced diameter of through opening **81**, restricting valve assembly **80** restricts the flow of water inside elongated tubular shaft **64**. Varying the diameter of opening **81** changes the time it takes piston assembly **60** to travel inside cylindrical members **44** and **48**. Therefore, a user can regulate this time by replacing valve assemblies **80** of different diameters.

As seen in figure 1, the pressure differential created by electrical suction pump **50** at bottom outlet port **25** suctions the water in cavity **23** causing water to go through cutout **41** from space **43**. The water displace from space **43** is replaced with water coming from through inlet through opening **32**. Piston assembly **60** is allowed to move towards cover assembly **30** as water passing through opening **69** enters space **43** below bottom wall **62**. The speed at which piston assembly **60** moves upwardly depends on the flow rate of water through restricting valve assembly **80**. Water enters the space **43'** to permit piston assembly **60** to move up. When top surface **63** of piston assembly **60** reaches cover assembly **30**, valve assembly **38** is opened permitting water to enter to inlet through opening

34 and closing inlet through opening 32. Since piston 60 stops moving up at the extreme position, no more water comes in space 43'.

As best seen in figure 3, filter cap assembly 90 is mounted to internal threaded portion 66 of elongated tubular shaft 64. Filter cap assembly 90 includes central opening 91, upper end 92, stopper flange 93, lower end 94, threaded portion 95 and mesh 96. Its purpose is to keep restricting valve assembly 80 in place and filter the water to prevent clogging opening 81. When suction pump 50 stops, valve assembly 80 moves upwardly against end 94 by the pressure exerted on the water in space 43' by the weight of piston assembly 60. Upper end 82 comes in contact with lower end 94 and O-ring 88 is separated from its seat allowing water to go up with a larger effective diameter since in addition to opening 81 the water will flow through channels 86.

An alternate embodiment for pool cleaner control device 100 is shown in figure 4, wherein flexible diaphragm skirt 170 has a substantially inverted cup shape with cooperative dimensions to cover bottom surface 62 of piston assembly 60. The peripheral edge 172 coacts with the internal wall surface of housing assembly 40 to effectively and substantial seal space 43' from space 43.

It is also possible to use a spring 264 to urge piston assembly 60 against bottom wall 46 if the pulling force of the water current is two strong, as shown alternate embodiment 200 represented in figure 5.

Shimmers 20 are typically used with a timer that can be regulated to stop the operation at predetermined time periods. In one preferred setting,

the timer period is chosen to operate each inlet port for substantially equal time periods. This requires selecting a predetermined diameter for opening **81**, and the characteristics of spring **264** if one is used.

The foregoing description conveys the best understanding of the objectives and advantages of the present invention. Different embodiments may be made of the inventive concept of this invention. It is to be understood that all matter disclosed herein is to be interpreted merely as illustrative, and not in a limiting sense.